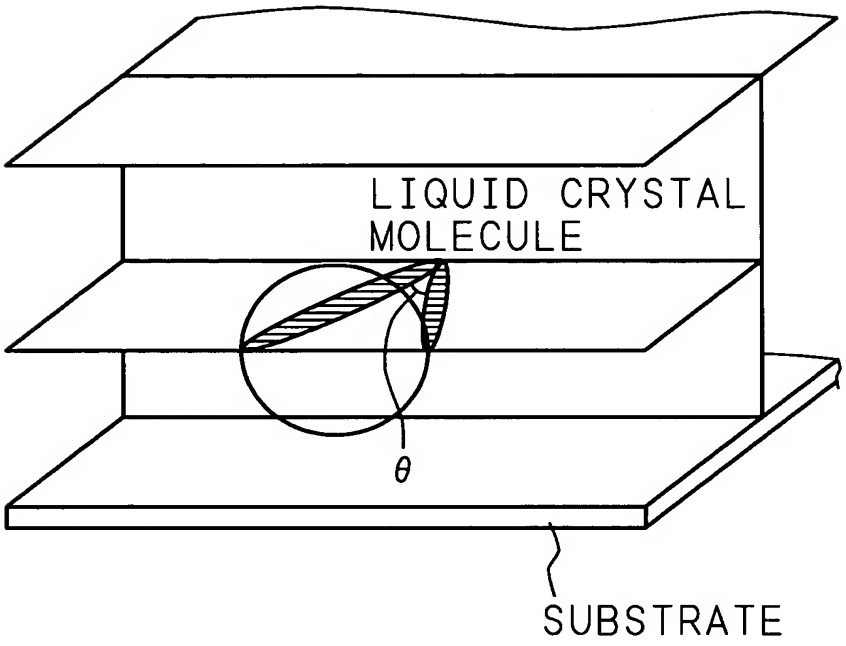
FIG. 1
PRIOR ART



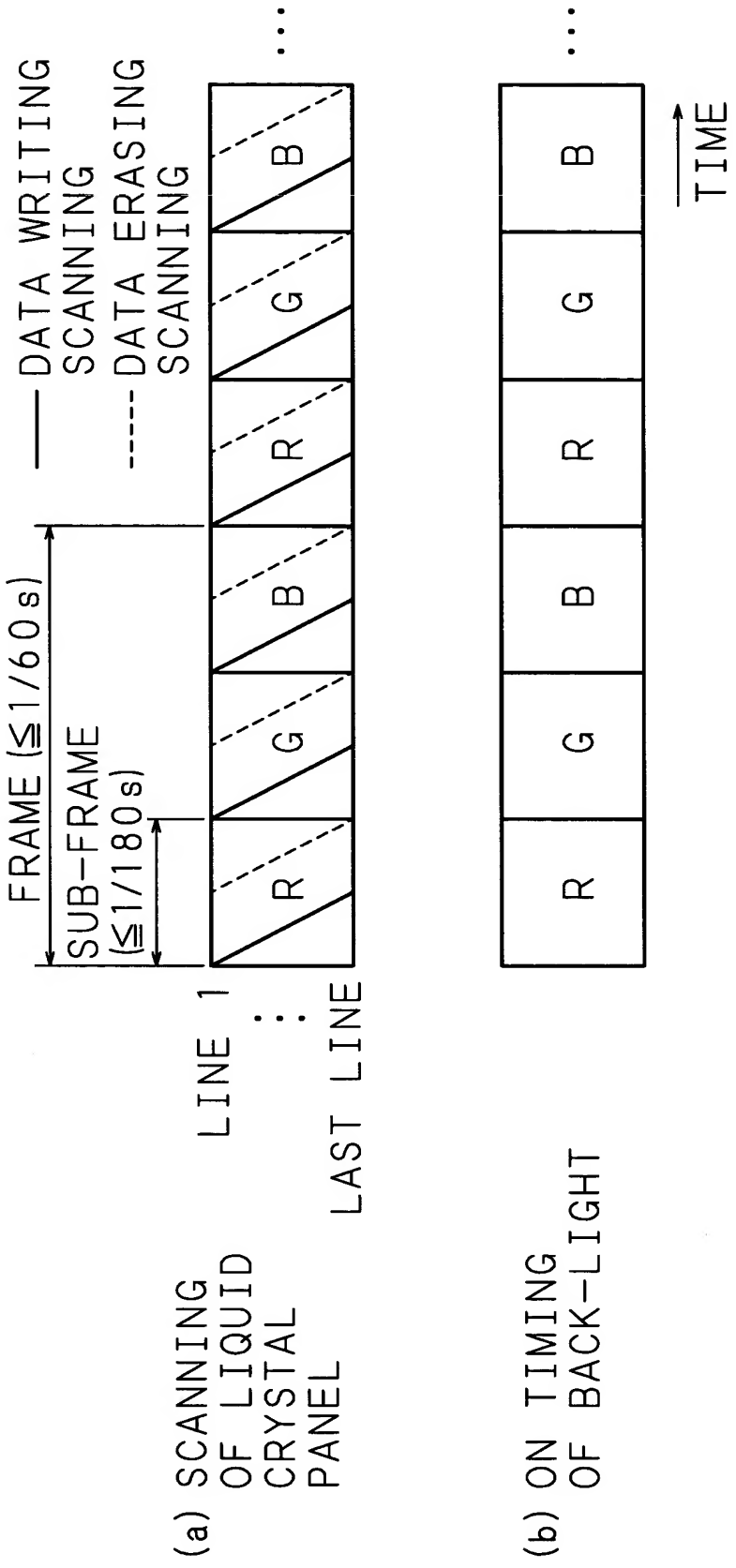


FIG. 2
PRIOR ART

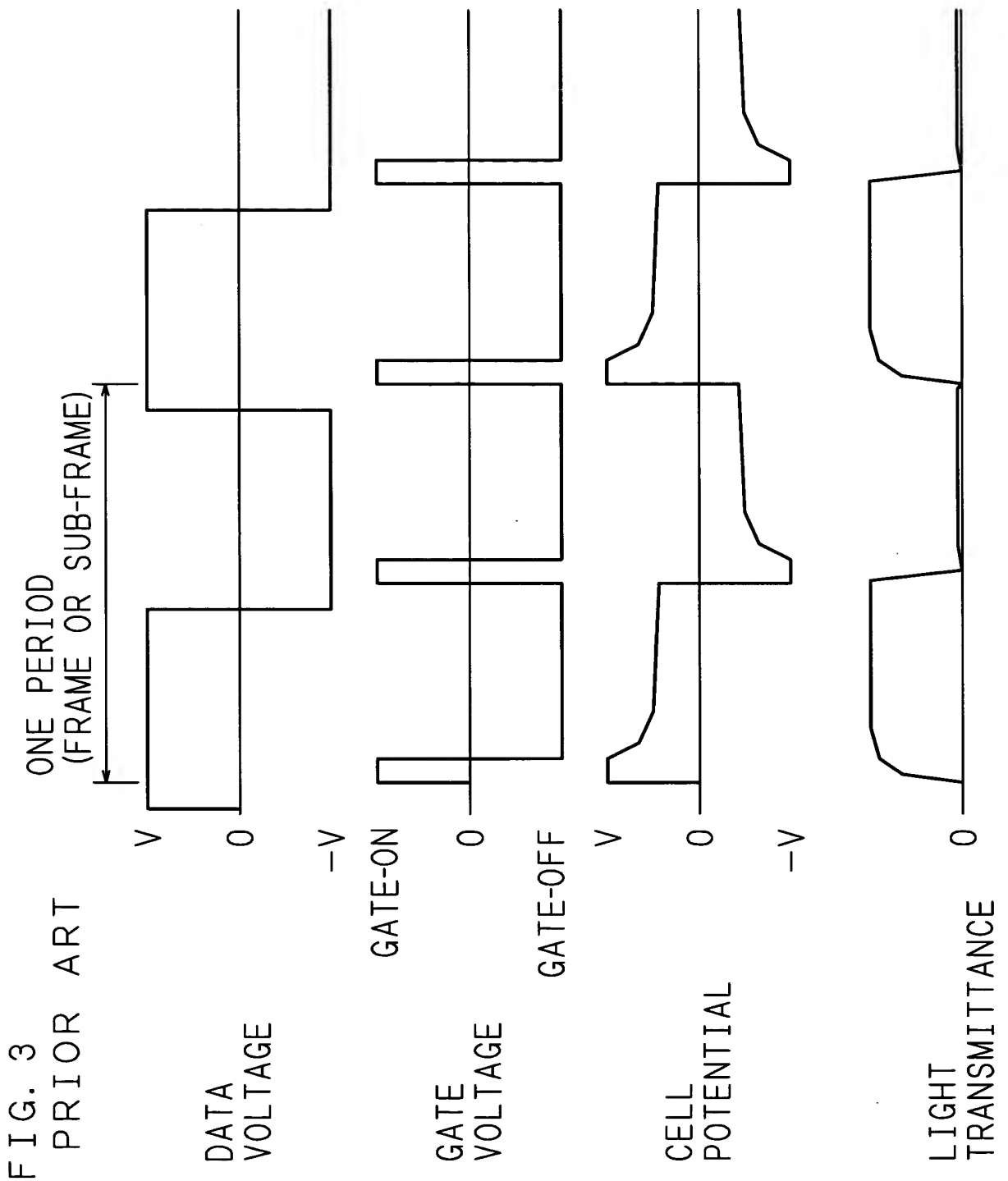


FIG. 3
PRIOR ART

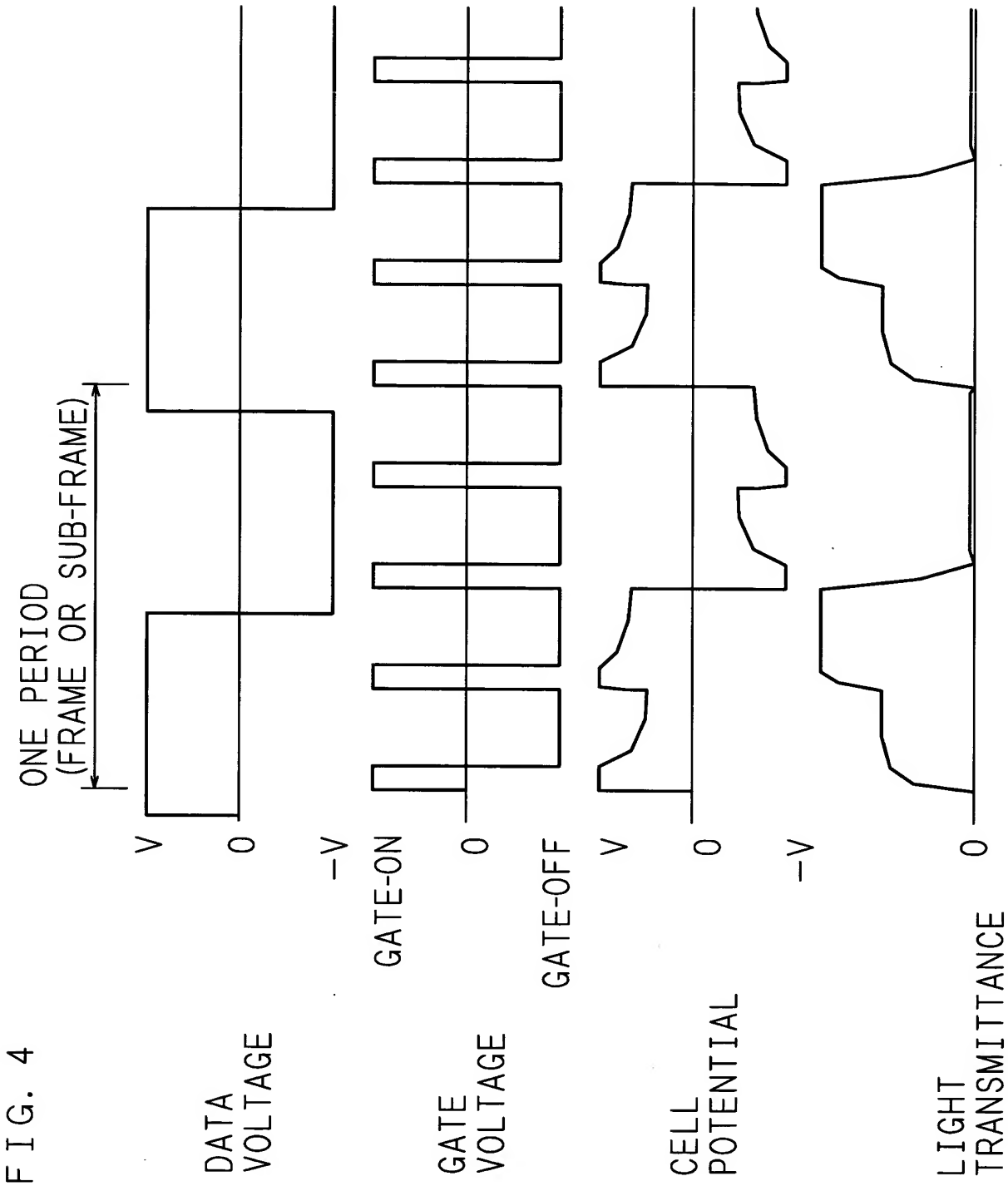

ONE PERIOD
(FRAME OR SUB-FRAME)
V
0
-V
DATA VOLTAGE
GATE-ON
0
GATE-OFF
GATE VOLTAGE
V
0
-V
CELL POTENTIAL
LIGHT TRANSMITTANCE
0

FIG. 4

FIG. 5

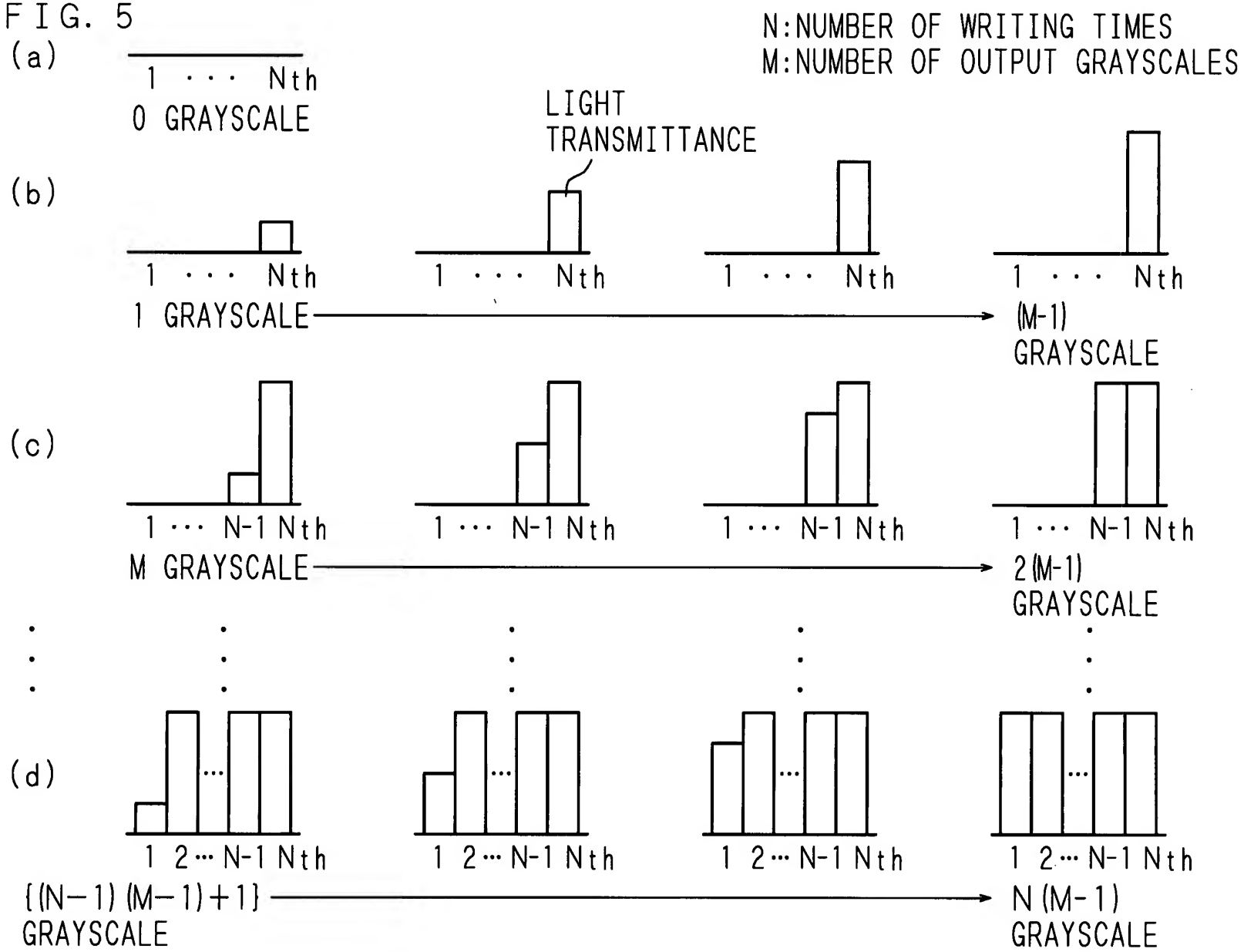


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FIG. 6A

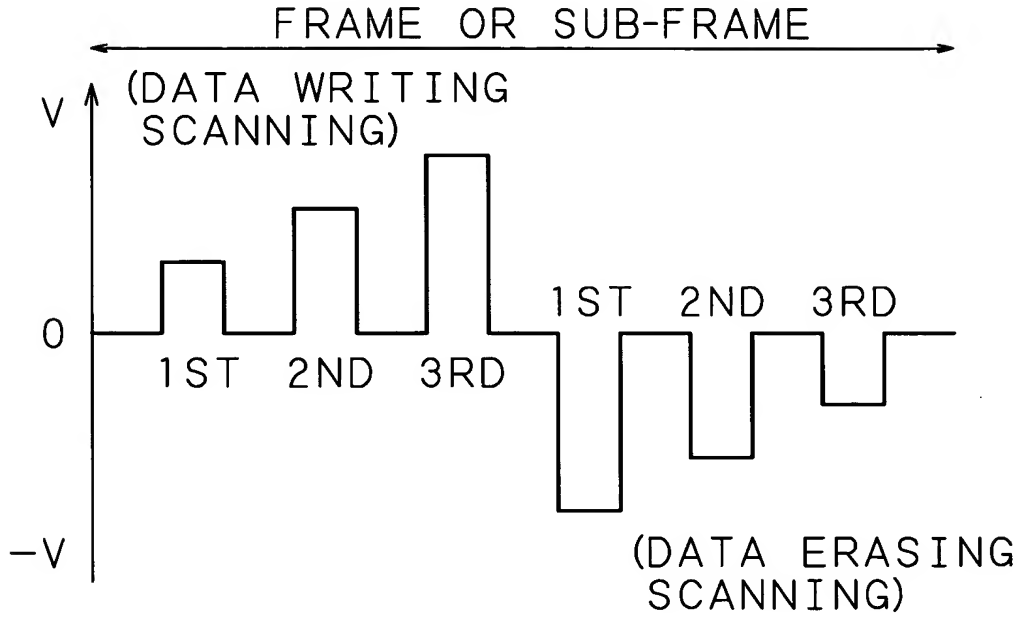
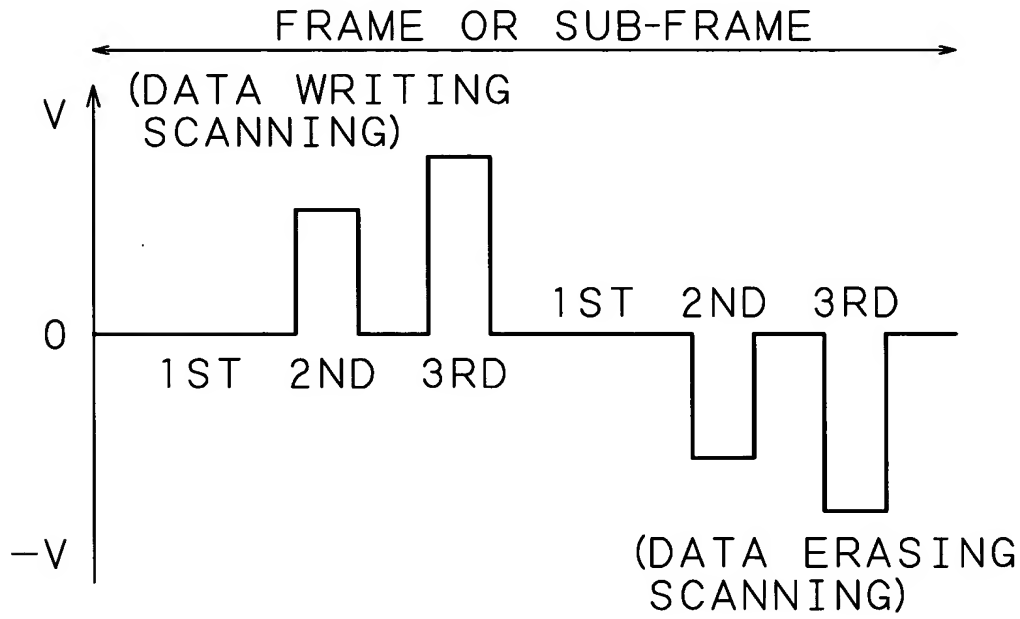

FRAME OR SUB-FRAME
V
(DATA WRITING SCANNING)
0
1ST 2ND 3RD
1ST 2ND 3RD
-V
(DATA ERASING SCANNING)

FIG. 6B


FRAME OR SUB-FRAME
V
(DATA WRITING SCANNING)
0
1ST 2ND 3RD
1ST 2ND 3RD
-V
(DATA ERASING SCANNING)

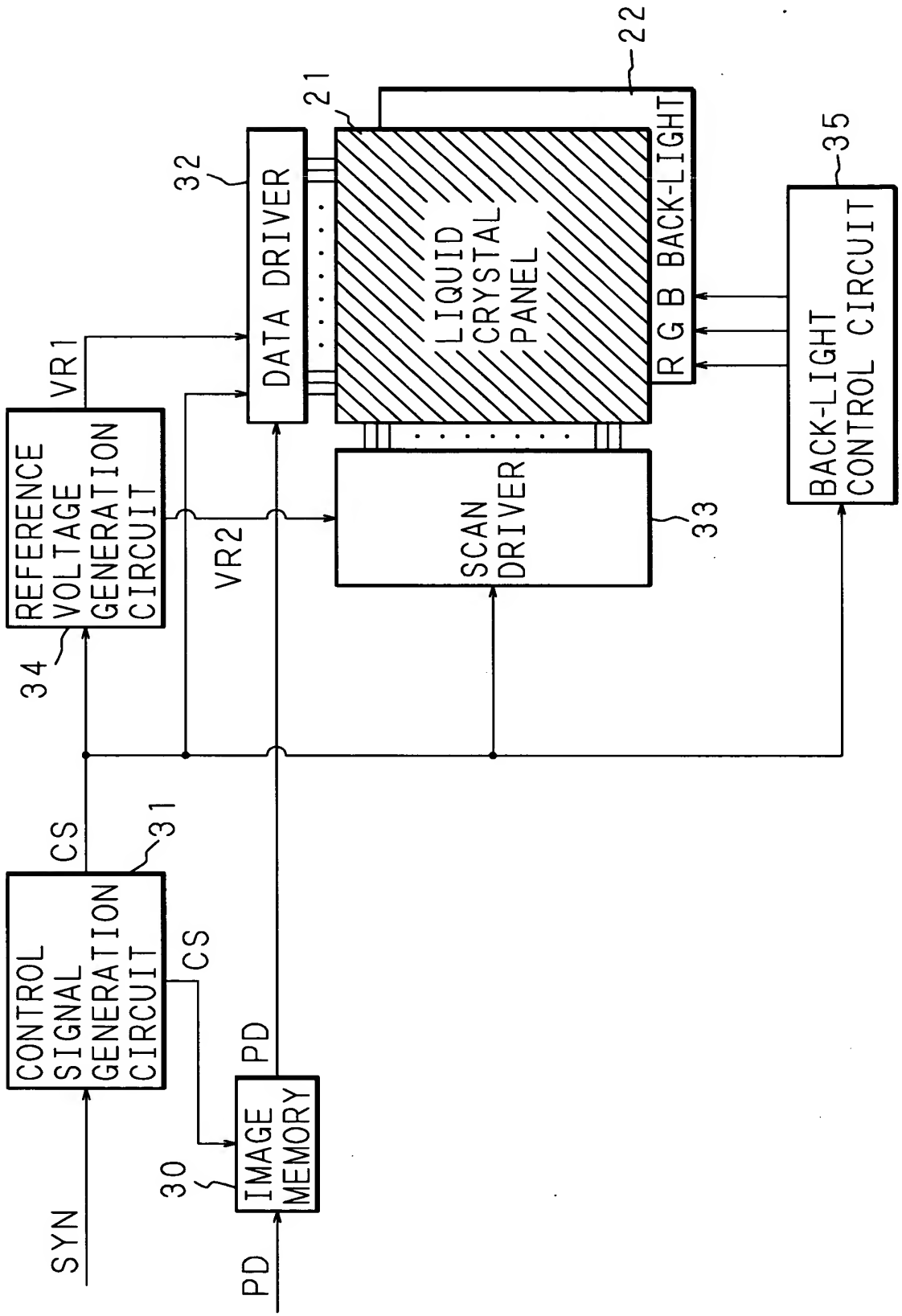

22
21
32
DATA DRIVER
LIQUID CRYSTAL PANEL
R G B BACK-LIGHT
35
BACK-LIGHT CONTROL CIRCUIT
VR1
REFERENCE VOLTAGE GENERATION CIRCUIT
VR2
SCAN DRIVER
33
34
CS
31
CONTROL SIGNAL GENERATION CIRCUIT
CS
PD
IMAGE MEMORY
30
SYN
PD

FIG. 7

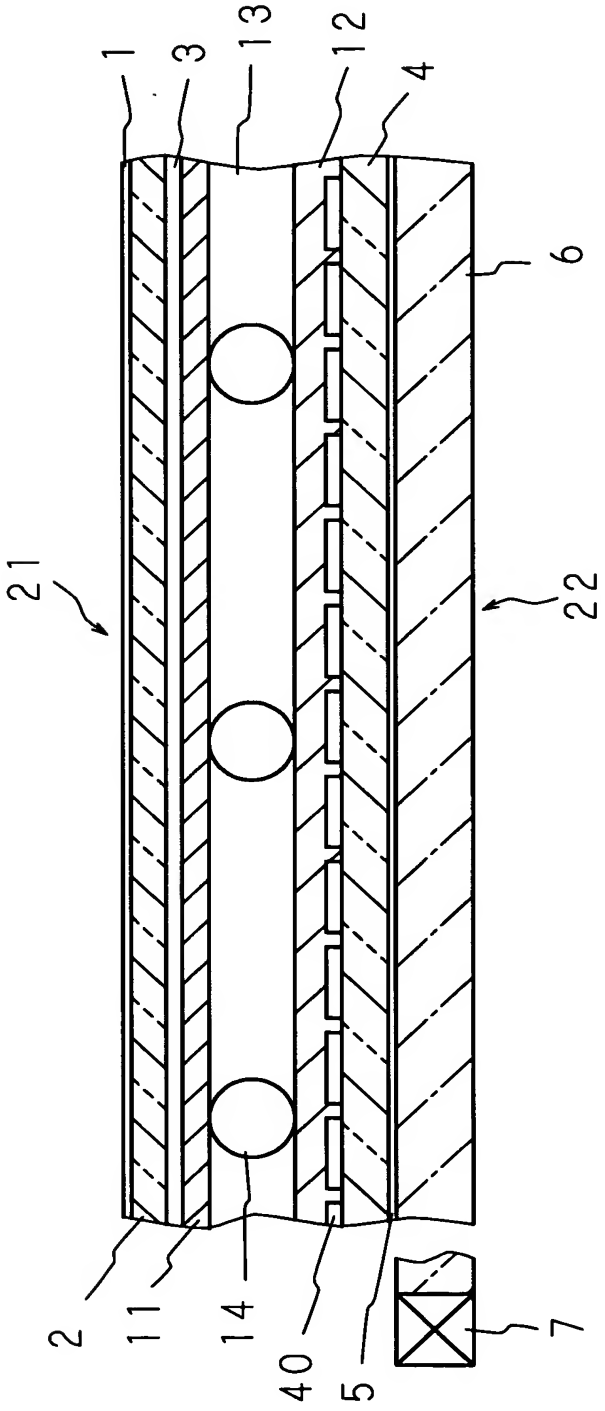


FIG. 8

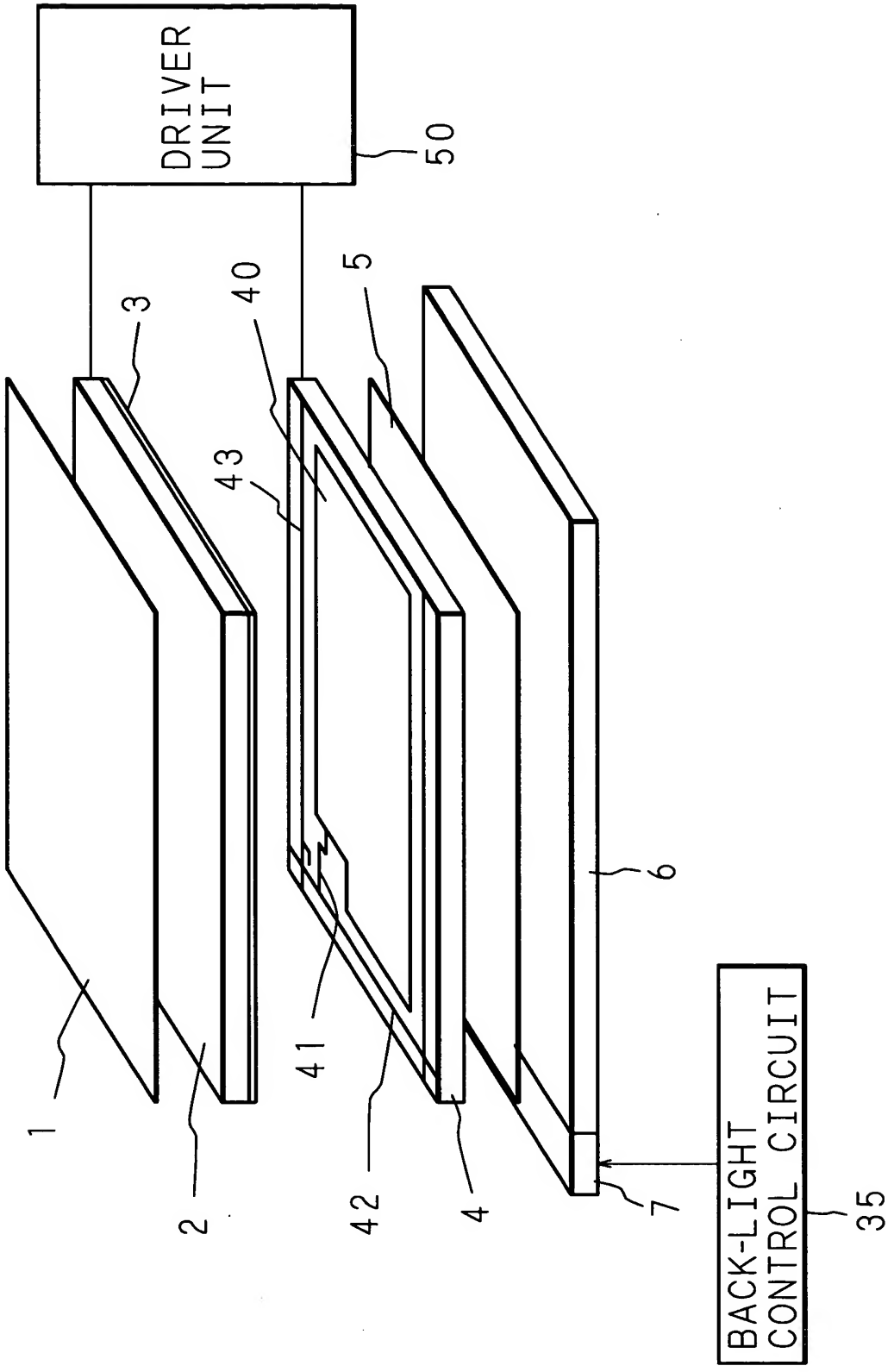

DRIVER UNIT
50
3
40
5
43
1
2
41
42
4
6
7
BACK-LIGHT CONTROL CIRCUIT
35

FIG. 9

FIG. 10

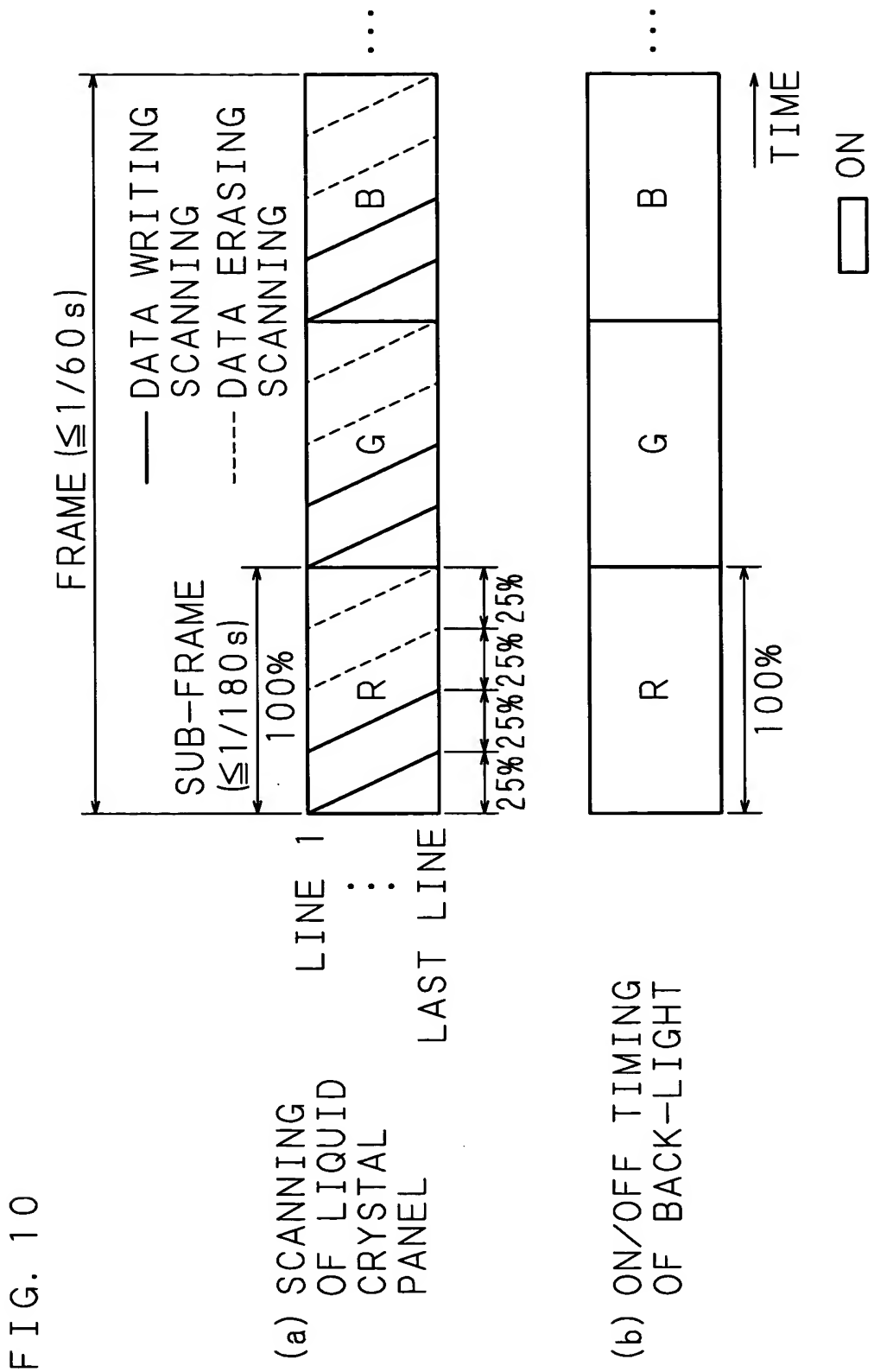
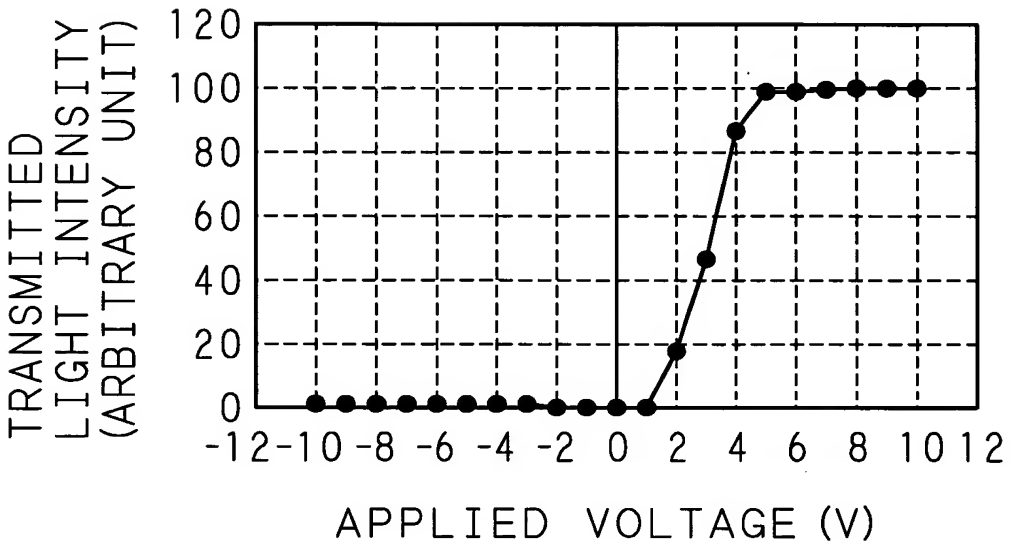

FRAME (≦1/60 s)
DATA WRITING SCANNING
DATA ERASING SCANNING
SUB-FRAME (≦1/180 s)
100%
25%
25%
25%
25%
R
G
B
LINE 1
LAST LINE
(a) SCANNING OF LIQUID CRYSTAL PANEL
(b) ON/OFF TIMING OF BACK-LIGHT
TIME
ON

FIG. 11


TRANSMITTED LIGHT INTENSITY (ARBITRARY UNIT)
120
100
80
60
40
20
0
-12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12
APPLIED VOLTAGE (V)

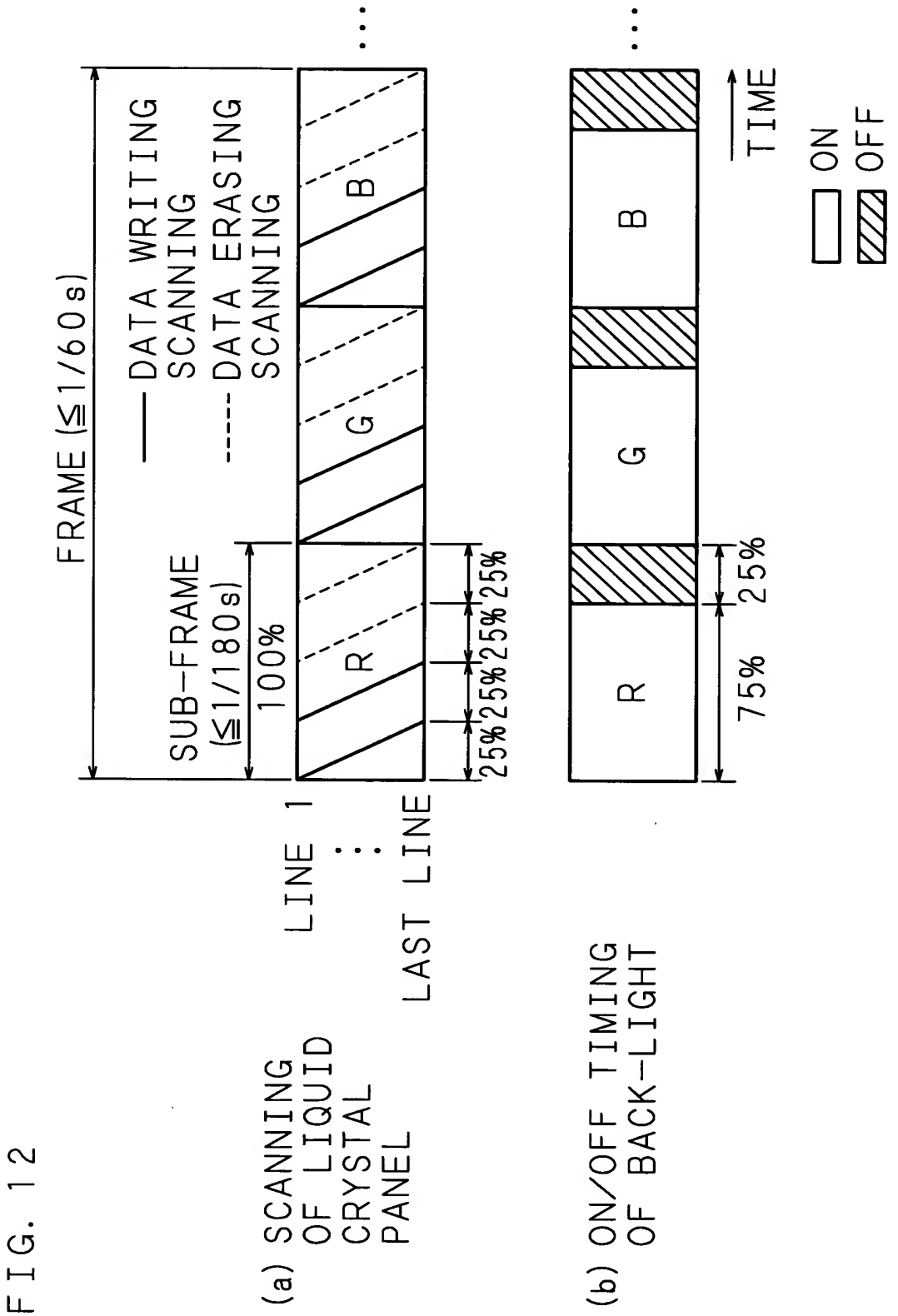

FRAME (≦1/60s)
DATA WRITING SCANNING
DATA ERASING SCANNING
SUB-FRAME (≦1/180s)
100%
R
G
B
25%
25%
25%
25%
LINE 1
LAST LINE
(a) SCANNING OF LIQUID CRYSTAL PANEL
75%
25%
TIME
ON
OFF
(b) ON/OFF TIMING OF BACK-LIGHT

FIG. 12

FIG. 13
PRIOR ART

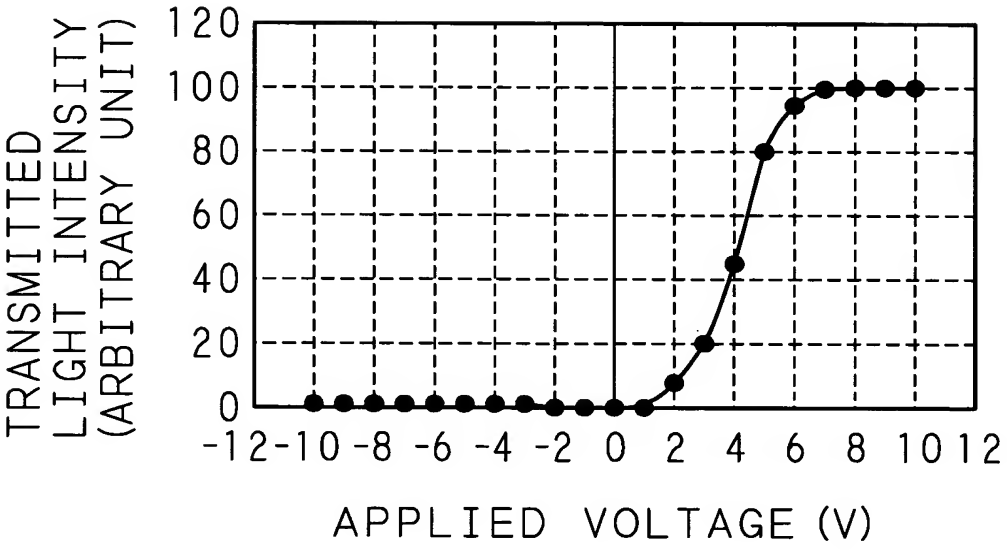
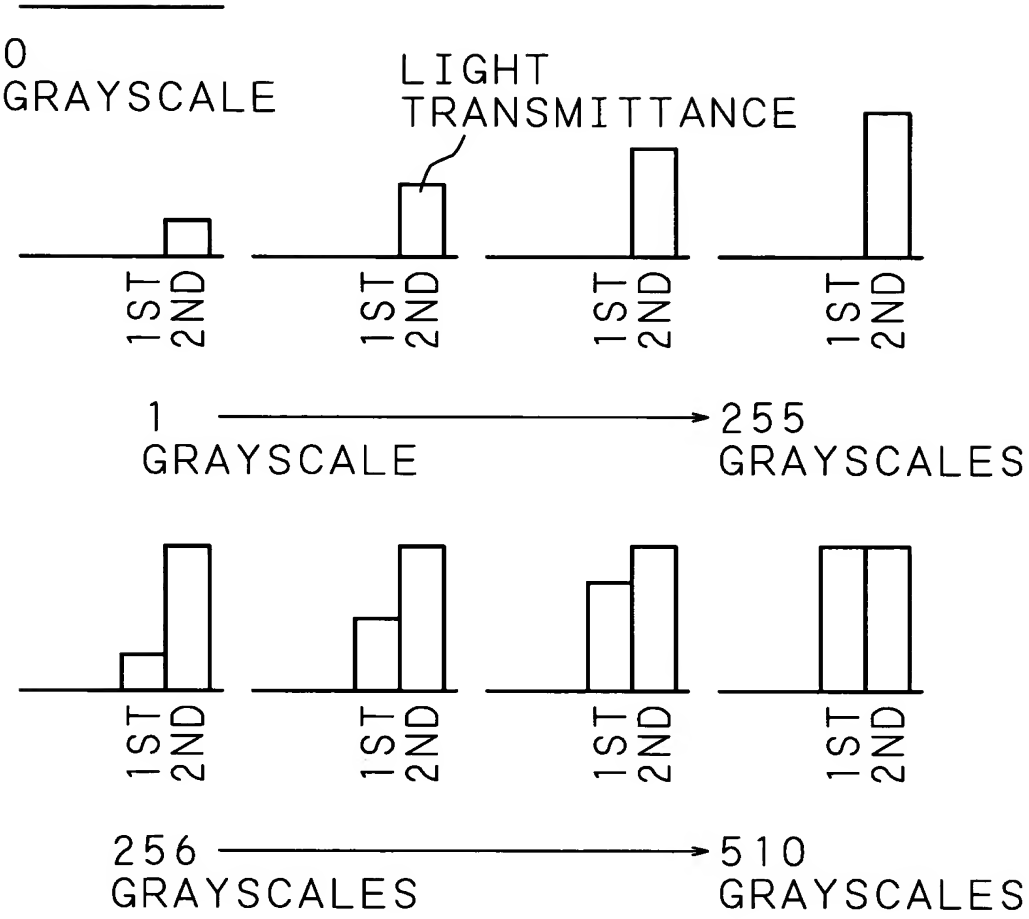


FIG. 14


0
GRAYSCALE
LIGHT
TRANSMITTANCE
1ST
2ND
1
GRAYSCALE
255
GRAYSCALES
256
GRAYSCALES
510
GRAYSCALES

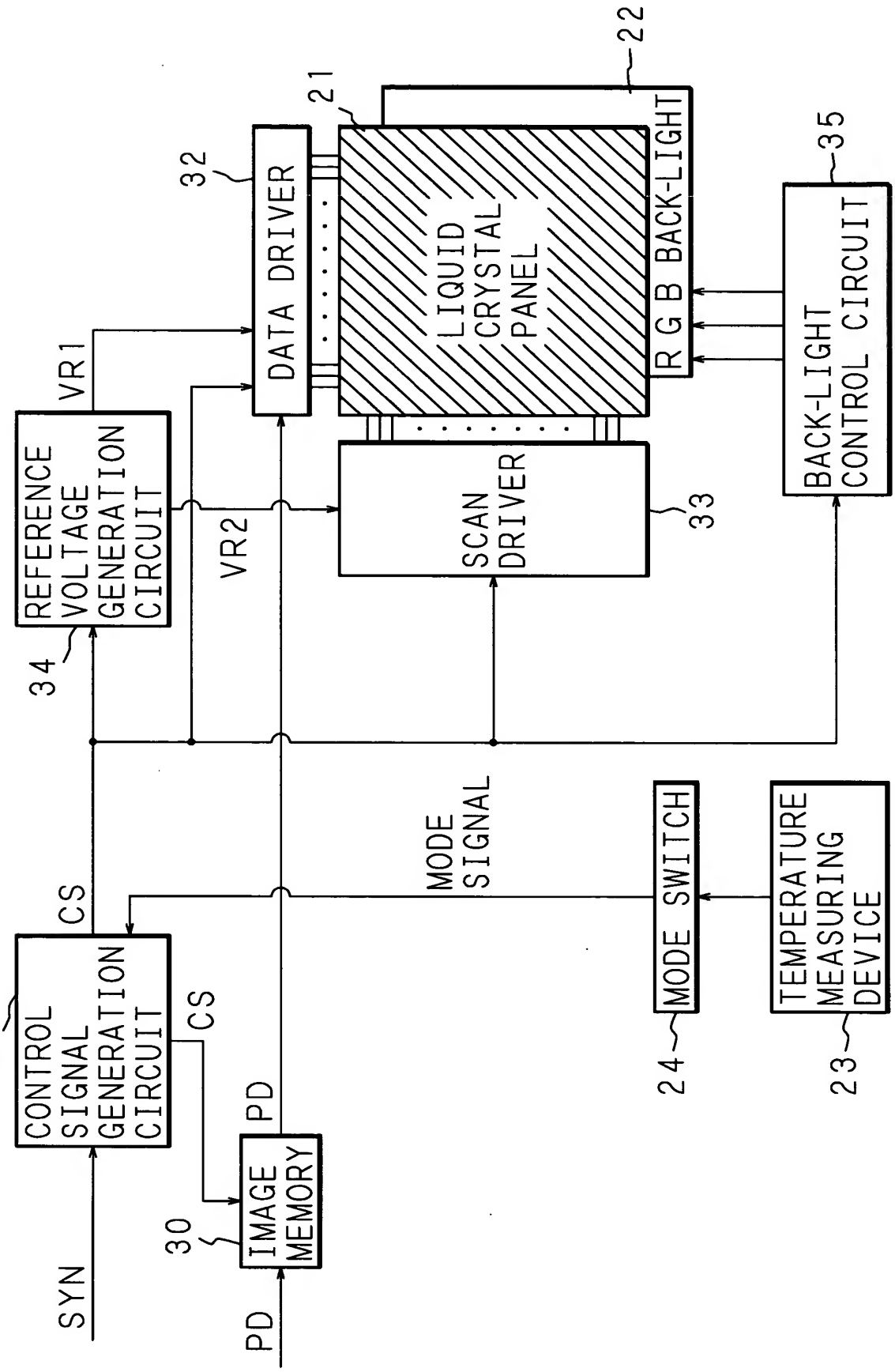

22
21
32
DATA DRIVER
LIQUID CRYSTAL PANEL
R G B BACK-LIGHT
35
BACK-LIGHT CONTROL CIRCUIT
VR1
REFERENCE VOLTAGE GENERATION CIRCUIT
VR2
SCAN DRIVER
33
34
MODE SIGNAL
MODE SWITCH
TEMPERATURE MEASURING DEVICE
24
23
CS
31
CONTROL SIGNAL GENERATION CIRCUIT
CS
PD
30
IMAGE MEMORY
SYN
PD

FIG. 15

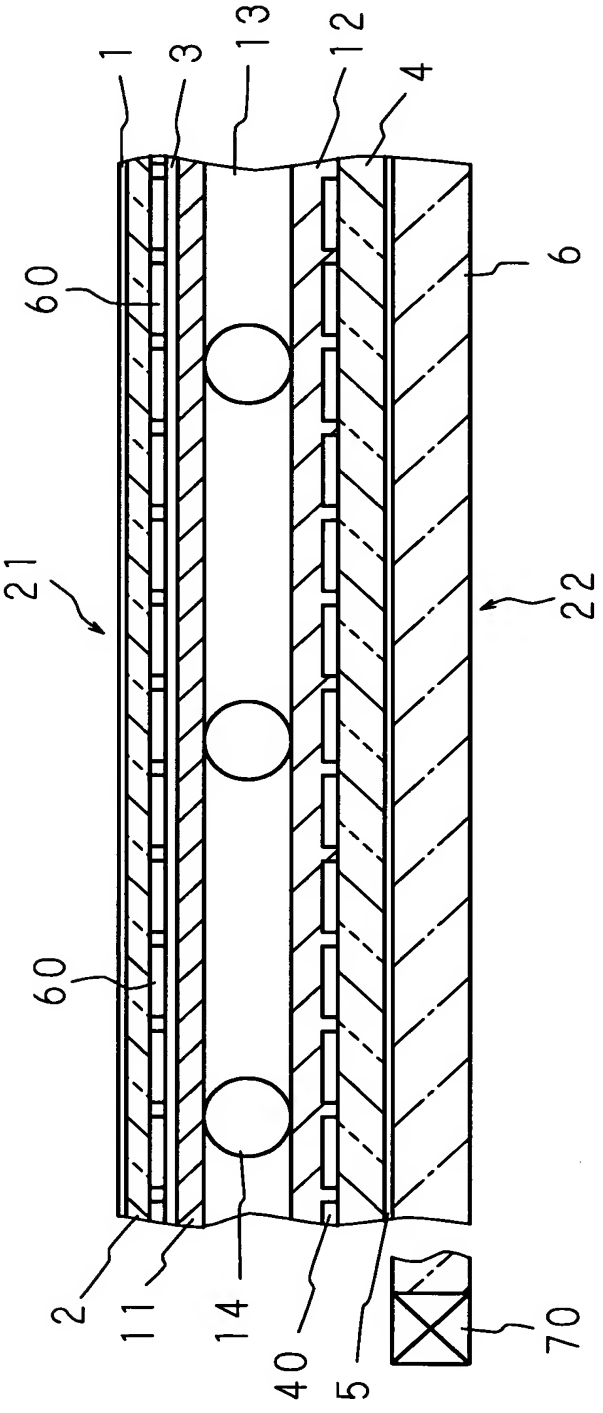


FIG. 16

FIG. 17

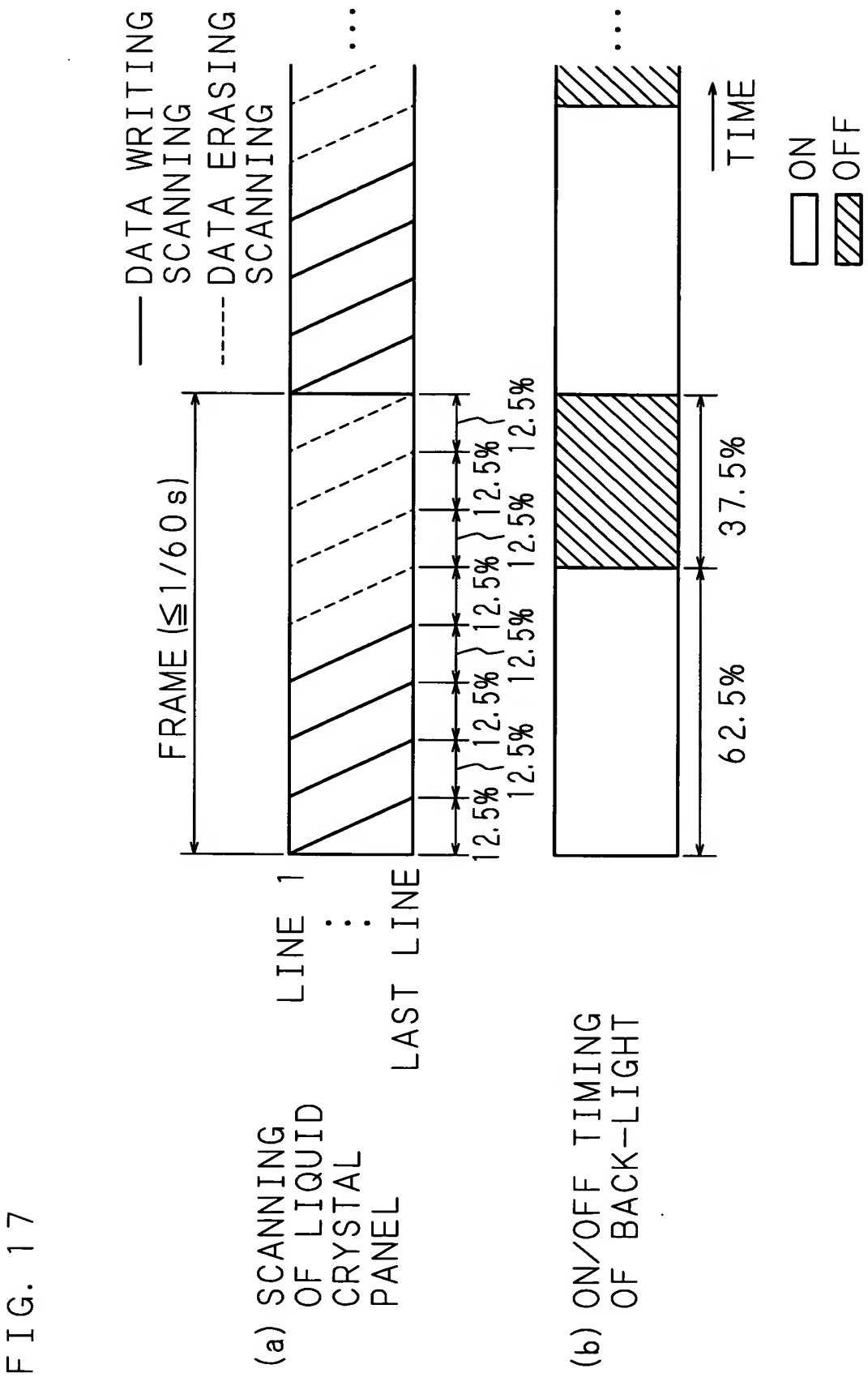
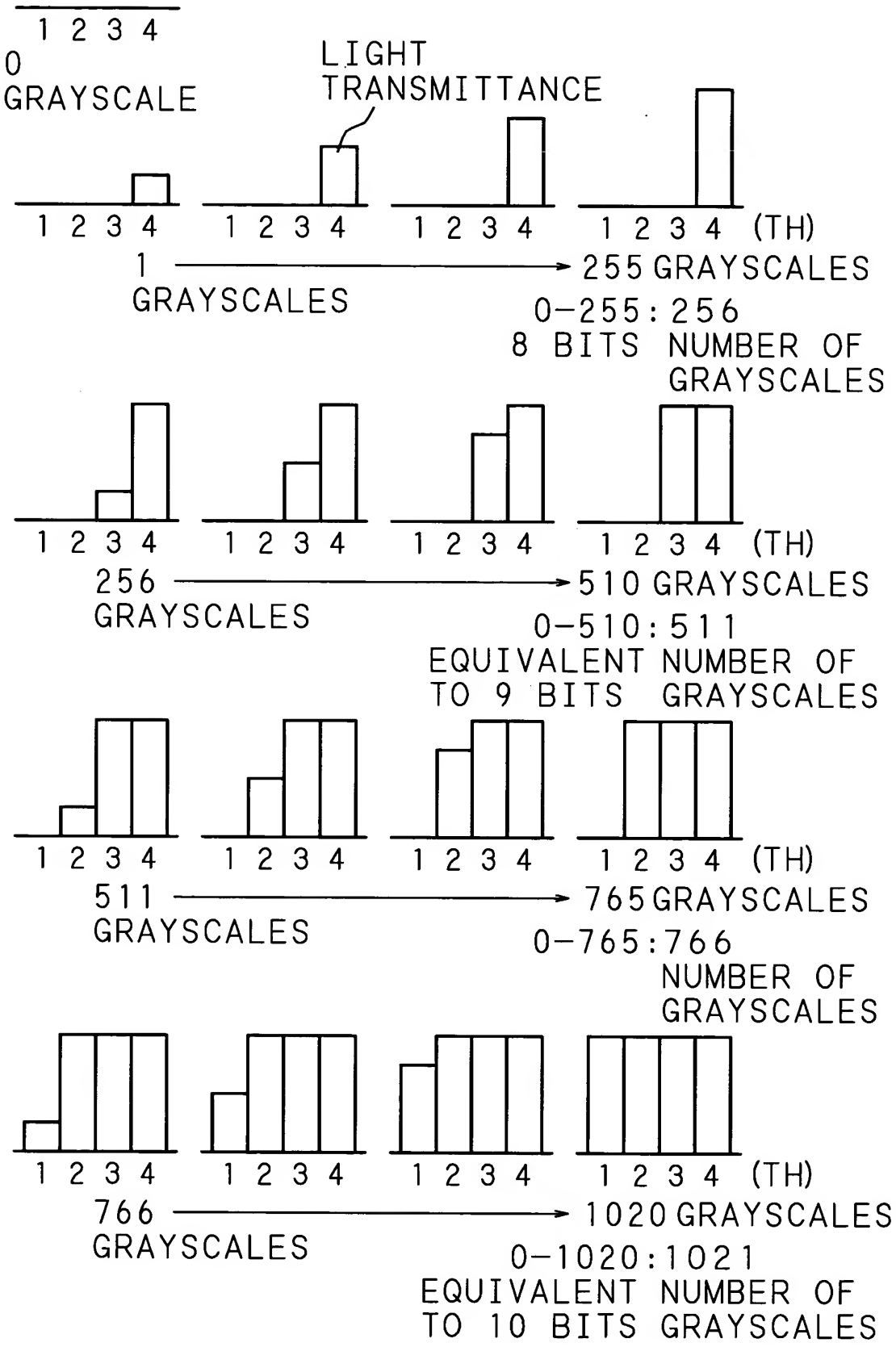

DATA WRITING SCANNING
DATA ERASING SCANNING
FRAME (≦1/60 s)
LINE 1
LAST LINE
12.5%
12.5%
12.5%
12.5%
12.5%
12.5%
12.5%
12.5%
37.5%
62.5%
TIME
ON
OFF
(a) SCANNING OF LIQUID CRYSTAL PANEL
(b) ON/OFF TIMING OF BACK-LIGHT

FIG. 18


1 2 3 4
0
GRAYSCALE
LIGHT
TRANSMITTANCE
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 (TH)
1
GRAYSCALES
255 GRAYSCALES
0-255:256
8 BITS NUMBER OF
GRAYSCALES
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 (TH)
256
GRAYSCALES
510 GRAYSCALES
0-510:511
EQUIVALENT NUMBER OF
TO 9 BITS GRAYSCALES
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 (TH)
511
GRAYSCALES
765 GRAYSCALES
0-765:766
NUMBER OF
GRAYSCALES
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 (TH)
766
GRAYSCALES
1020 GRAYSCALES
0-1020:1021
EQUIVALENT NUMBER OF
TO 10 BITS GRAYSCALES